

SEQUENCE LISTING

<110> Curtis, Rory A.J. et al.

<120> NOVEL POTASSIUM CHANNEL MOLECULES AND USES THEREFOR

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<151> 01-11-1999

<150> US 09/259,951

<151> 01-03-1999

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<170> PatentIn Ver. 2.0

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Gly	Leu	Tyr	Tyr	Ser	Phe	Ile	Thr	Ile	Ser	Thr	Ile	Gly	Phe	Gly	Asp	195	200	205	
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Trp Ile Ser Ala Leu Gly Lys Phe Phe Gly Gly Arg Ala Lys Arg Leu	
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acccaaacta aagactacat tttccatcca ccctagaggc tgggtgcagc tatatgatta 1247

attctgcccc ataggggtata cagagacatg tcctgggtga catgggatgt gactttcggg 1307

tgtcgggggca gcatgccctt ctccccact tccttacttt agcgggctgc aatgccgccg 1367

atatgatggc tgggagctct ggcagccata cggcaccatg aagtagcggc aatgtttgag 1427

cggcacaata agataggaag agtctggatc tctgatgatc acagagccat cctaacaaac 1487

ggaatatcac ccgacctcct ttatgtgaga gagaaataaa catcttatgt aaaatacaaa 1547

aaaaaaaaaa aaaaaaaagg gcggccgc 1575

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 <212> PRT
 <213> Homo sapiens

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Cys Ala Val Pro Gly Thr Val Leu Leu Leu Ala Tyr Leu Ala Tyr
                20                25                30

Leu Ala Leu Gly Thr Gly Val Phe Trp Thr Leu Glu Gly Arg Ala Ala
 35                40                45

Gln Asp Ser Ser Arg Ser Phe Gln Arg Asp Lys Trp Glu Leu Leu Gln
 50                55                60

Asn Phe Thr Cys Leu Asp Arg Pro Ala Leu Asp Ser Leu Ile Arg Asp
 65                70                75                80

Val Val Gln Ala Tyr Lys Asn Gly Ala Ser Leu Leu Ser Asn Thr Thr
                85                90                95

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Ser Met Gly Arg Trp Glu Leu Val Gly Ser Phe Phe Phe Ser Val Ser
100 105 110

Thr Ile Thr Thr Ile Gly Tyr Gly Asn Leu Ser Pro Asn Thr Met Ala
115 120 125

Ala Arg Leu Phe Cys Ile Phe Phe Ala Leu Val Gly Ile Pro Leu Asn
130 135 140

Leu Val Val Leu Asn Arg Leu Gly His Leu Met Gln Gln Gly Val Asn
145 150 155 160

His Trp Ala Ser Arg Leu Gly Gly Thr Trp Gln Asp Pro Asp Lys Ala
165 170 175

Arg Trp Leu Ala Gly Ser Gly Ala Leu Leu Ser Gly Leu Leu Leu Phe
180 185 190

Leu Leu Leu Pro Pro Leu Leu Phe Ser His Met Glu Gly Trp Ser Tyr
195 200 205

Thr Glu Gly Phe Tyr Phe Ala Phe Ile Thr Leu Ser Thr Val Gly Phe
210 215 220

Gly Asp Tyr Val Ile Gly Met Asn Pro Ser Gln Arg Tyr Pro Leu Trp
225 230 235 240

Tyr Lys Asn Met Val Ser Leu Trp Ile Leu Phe Gly Met Ala Trp Leu
245 250 255

Ala Leu Ile Ile Lys Leu Ile Leu Ser Gln Leu Glu Thr Pro Gly Arg
260 265 270

Val Cys Ser Cys Cys His His Ser Ser Lys Glu Asp Phe Lys Ser Gln
275 280 285

Ser Trp Arg Gln Gly Pro Asp Arg Glu Pro Glu Ser His Ser Pro Gln
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Gln Gly Cys Tyr Pro Glu Gly Pro Met Gly Ile Ile Gln His Leu Glu
305 310 315 320

Pro Ser Ala His Ala Ala Gly Cys Gly Lys Asp Ser
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Cys Ala Val Pro Gly Thr Val Leu Leu Leu Leu Ala Tyr Leu Ala Tyr	
20 25 30	
ctg gcg ctg ggc acc ggc gtg ttc tgg acg ctg gag ggc cgc gcg gcg	144
Leu Ala Leu Gly Thr Gly Val Phe Trp Thr Leu Glu Gly Arg Ala Ala	
35 40 45	
cag gac tcc agc cgc agc ttc cag cgc gac aag tgg gag ctg ttg cag	192
Gln Asp Ser Ser Arg Ser Phe Gln Arg Asp Lys Trp Glu Leu Leu Gln	
50 55 60	
aac ttc acg tgt ctg gac cgc ccg gcg ctg gac tcg ctg atc cgg gat	240
Asn Phe Thr Cys Leu Asp Arg Pro Ala Leu Asp Ser Leu Ile Arg Asp	
65 70 75 80	
gtc gtc caa gca tac aaa aac gga gcc agc ctc ctc agc aac acc acc	288
Val Val Gln Ala Tyr Lys Asn Gly Ala Ser Leu Leu Ser Asn Thr Thr	
85 90 95	
agc atg ggg cgc tgg gag ctc gtg ggc tcc ttc ttc ttt tct gtg tcc	336
Ser Met Gly Arg Trp Glu Leu Val Gly Ser Phe Phe Phe Ser Val Ser	
100 105 110	
acc atc acc acc att ggc tat ggc aac ctg agc ccc aac acg atg gct	384
Thr Ile Thr Thr Ile Gly Tyr Gly Asn Leu Ser Pro Asn Thr Met Ala	
115 120 125	
gcc cgc ctc ttc tgc atc ttc ttt gcc ctt gtg ggg atc cca ctc aac	432
Ala Arg Leu Phe Cys Ile Phe Phe Ala Leu Val Gly Ile Pro Leu Asn	
130 135 140	
ctc gtg gtg ctc aac cga ctg ggg cat ctc atg cag cag gga gta aac	480
Leu Val Val Leu Asn Arg Leu Gly His Leu Met Gln Gln Gly Val Asn	
145 150 155 160	
cac tgg gcc agc agg ctg ggg ggc acc tgg cag gat cct gac aag gcg	528
His Trp Ala Ser Arg Leu Gly Gly Thr Trp Gln Asp Pro Asp Lys Ala	
165 170 175	
cgg tgg ctg gcg ggc tct ggc gcc ctc ctc tcg ggc ctc ctg ctc ttc	576
Arg Trp Leu Ala Gly Ser Gly Ala Leu Leu Ser Gly Leu Leu Leu Phe	
180 185 190	
ctg ctg ctg cca ccg ctg ctc ttc tcc cac atg gag ggc tgg agc tac	624
Leu Leu Leu Pro Pro Leu Leu Phe Ser His Met Glu Gly Trp Ser Tyr	
195 200 205	
aca gag ggc ttc tac ttc gcc ttc atc acc ctc agc acc gtg ggc ttc	672
Thr Glu Gly Phe Tyr Phe Ala Phe Ile Thr Leu Ser Thr Val Gly Phe	
210 215 220	
ggc gac tac gtg att gga atg aac ccc tcc cag agg tac cca ctg tgg	720
Gly Asp Tyr Val Ile Gly Met Asn Pro Ser Gln Arg Tyr Pro Leu Trp	
225 230 235 240	
tac aag aac atg gtg tcc ctg tgg atc ctc ttt ggg atg gca tgg ctg	768
Tyr Lys Asn Met Val Ser Leu Trp Ile Leu Phe Gly Met Ala Trp Leu	
245 250 255	

ctt gct aac gct tcg ggg tcc gcc aac gcc tcg gac ccc gcc tgg gac 411
 Leu Ala Asn Ala Ser Gly Ser Ala Asn Ala Ser Asp Pro Ala Trp Asp
 80 85 90

ttc gcc tct gct ctc ttc ttc gcc agc acg ctg atc acc acc gtg ggc	459
Phe Ala Ser Ala Leu Phe Phe Ala Ser Thr Leu Ile Thr Thr Val Gly	
95 100 105	
tat ggg tac aca acg cca ctg act gat gcg ggc aag gcc ttc tcc atc	507
Tyr Gly Tyr Thr Thr Pro Leu Thr Asp Ala Gly Lys Ala Phe Ser Ile	
110 115 120	
gcc ttt gcg ctc ctg ggc gtg ccg acc acc atg ctg ctg ctg acc gcc	555
Ala Phe Ala Leu Leu Gly Val Pro Thr Thr Met Leu Leu Leu Thr Ala	
125 130 135 140	
tca gcc cag cgc ctg tca ctg ctg ctg act cac gtg ccc ctg tct tgg	603
Ser Ala Gln Arg Leu Ser Leu Leu Leu Thr His Val Pro Leu Ser Trp	
145 150 155	
ctg agc atg cgt tgg ggc tgg gac ccc cgg cgg gcg gcc tgc tgg cac	651
Leu Ser Met Arg Trp Gly Trp Asp Pro Arg Arg Ala Ala Cys Trp His	
160 165 170	
ttg gtg gcc ctg ttg ggg gtc gta gtg acc gtc tgc ttt ctg gtg ccg	699
Leu Val Ala Leu Leu Gly Val Val Val Thr Val Cys Phe Leu Val Pro	
175 180 185	
gct gtg atc ttt gcc cac ctc gag gag gcc tgg agc ttc ttg gat gcc	747
Ala Val Ile Phe Ala His Leu Glu Glu Ala Trp Ser Phe Leu Asp Ala	
190 195 200	
ttc tac ttc tgc ttt atc tct ctg tcc acc atc ggc ctg ggc gac tac	795
Phe Tyr Phe Cys Phe Ile Ser Leu Ser Thr Ile Gly Leu Gly Asp Tyr	
205 210 215 220	
gtg ccc ggg gag gcc cct ggc cag ccc tac cgg gcc ctc tac aag gtg	843
Val Pro Gly Glu Ala Pro Gly Gln Pro Tyr Arg Ala Leu Tyr Lys Val	
225 230 235	
ctg gtc aca gtc tac ctc ttc ctg ggc ctg gtg gcc atg gtg ctg gtg	891
Leu Val Thr Val Tyr Leu Phe Leu Gly Leu Val Ala Met Val Leu Val	
240 245 250	
ctg cag acc ttc cgc cac gtg tcc gac ctc cac ggc ctc acg gag ctc	939
Leu Gln Thr Phe Arg His Val Ser Asp Leu His Gly Leu Thr Glu Leu	
255 260 265	
atc ctg ctg ccc cct ccg tgc cct gcc agt ttc aat gcg gat gag gac	987
Ile Leu Leu Pro Pro Pro Cys Pro Ala Ser Phe Asn Ala Asp Glu Asp	
270 275 280	
gat cgg gtg gac atc ctg ggc ccc cag ccg gag tcg cac cag caa ctc	1035
Asp Arg Val Asp Ile Leu Gly Pro Gln Pro Glu Ser His Gln Gln Leu	
285 290 295 300	
tct gcc agc tcc cac acc gac tac gct tcc atc ccc agg tagctggggc	1084
Ser Ala Ser Ser His Thr Asp Tyr Ala Ser Ile Pro Arg	
305 310	
agcctctgcc aggcttgggt gtgcctggcc tgggactgag gggccaggc gaccagagct	1144
ggctgtacag gaatgtccac gagcacagca ggtgatcttg aggcttggc gtccaccgtc	1204
tctcctttgt ttccagcat ctggctggga tgtgaaggc agcactccct gtcccatgt	1264

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ccctggaant cagccaggtt gagctcaaat cccaacttag ccasgtctgg cctgtgtcct 2164
tgggcagtca cactacctct ctgattttgt ttcmwaaatc atgtaaaatg gtgatcatca 2224
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agt 2287

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 <213> Homo sapiens

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 35 40 45
 Gln Arg Ser Pro Cys Val Ala Ala Pro Ala Leu Asp Ala Phe Val Glu
 50 55 60
 Arg Val Leu Ala Ala Gly Arg Leu Gly Arg Val Val Leu Ala Asn Ala
 65 70 75 80
 Ser Gly Ser Ala Asn Ala Ser Asp Pro Ala Trp Asp Phe Ala Ser Ala
 85 90 95

Leu Phe Phe Ala Ser Thr Leu Ile Thr Thr Val Gly Tyr Gly Tyr Thr
 100 105 110
 Thr Pro Leu Thr Asp Ala Gly Lys Ala Phe Ser Ile Ala Phe Ala Leu
 115 120 125
 Leu Gly Val Pro Thr Thr Met Leu Leu Leu Thr Ala Ser Ala Gln Arg
 130 135 140
 Leu Ser Leu Leu Leu Thr His Val Pro Leu Ser Trp Leu Ser Met Arg
 145 150 155 160
 Trp Gly Trp Asp Pro Arg Arg Ala Ala Cys Trp His Leu Val Ala Leu
 165 170 175
 Leu Gly Val Val Val Thr Val Cys Phe Leu Val Pro Ala Val Ile Phe
 180 185 190
 Ala His Leu Glu Glu Ala Trp Ser Phe Leu Asp Ala Phe Tyr Phe Cys
 195 200 205
 Phe Ile Ser Leu Ser Thr Ile Gly Leu Gly Asp Tyr Val Pro Gly Glu
 210 215 220
 Ala Pro Gly Gln Pro Tyr Arg Ala Leu Tyr Lys Val Leu Val Thr Val
 225 230 235 240
 Tyr Leu Phe Leu Gly Leu Val Ala Met Val Leu Val Leu Gln Thr Phe
 245 250 255
 Arg His Val Ser Asp Leu His Gly Leu Thr Glu Leu Ile Leu Leu Pro
 260 265 270
 Pro Pro Cys Pro Ala Ser Phe Asn Ala Asp Glu Asp Asp Arg Val Asp
 275 280 285
 Ile Leu Gly Pro Gln Pro Glu Ser His Gln Gln Leu Ser Ala Ser Ser
 290 295 300
 His Thr Asp Tyr Ala Ser Ile Pro Arg
 305 310

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 Tyr Leu Val Leu Gly Ala Leu Leu Val Ala Arg Leu Glu Gly Pro His
 20 25 30

gaa gcc agg ctc cga gcc gag ctg gag acg ctg cgg gcg cag ctg ctt	144
Glu Ala Arg Leu Arg Ala Glu Leu Glu Thr Leu Arg Ala Gln Leu Leu	
35 40 45	
cag cgc agc ccg tgt gtg gct gcc ccc gcc ctg gac gcc ttc gtg gag	192
Gln Arg Ser Pro Cys Val Ala Ala Pro Ala Leu Asp Ala Phe Val Glu	
50 55 60	
cga gtg ctg gcg gcc gga cgg ctg ggg cgg gtc gtg ctt gct aac gct	240
Arg Val Leu Ala Ala Gly Arg Leu Gly Arg Val Val Leu Ala Asn Ala	
65 70 75 80	
tcg ggg tcc gcc aac gcc tcg gac ccc gcc tgg gac ttc gcc tct gct	288
Ser Gly Ser Ala Asn Ala Ser Asp Pro Ala Trp Asp Phe Ala Ser Ala	
85 90 95	
ctc ttc ttc gcc agc acg ctg atc acc acc gtg ggc tat ggg tac aca	336
Leu Phe Phe Ala Ser Thr Leu Ile Thr Thr Val Gly Tyr Gly Tyr Thr	
100 105 110	
acg cca ctg act gat gcg ggc aag gcc ttc tcc atc gcc ttt gcg ctc	384
Thr Pro Leu Thr Asp Ala Gly Lys Ala Phe Ser Ile Ala Phe Ala Leu	
115 120 125	
ctg ggc gtg ccg acc acc atg ctg ctg ctg acc gcc tca gcc cag cgc	432
Leu Gly Val Pro Thr Thr Met Leu Leu Leu Thr Ala Ser Ala Gln Arg	
130 135 140	
ctg tca ctg ctg ctg act cac gtg ccc ctg tct tgg ctg agc atg cgt	480
Leu Ser Leu Leu Leu Thr His Val Pro Leu Ser Trp Leu Ser Met Arg	
145 150 155 160	
tgg ggc tgg gac ccc cgg cgg gcg gcc tgc tgg cac ttg gtg gcc ctg	528
Trp Gly Trp Asp Pro Arg Arg Ala Ala Cys Trp His Leu Val Ala Leu	
165 170 175	
ttg ggg gtc gta gtg acc gtc tgc ttt ctg gtg ccg gct gtg atc ttt	576
Leu Gly Val Val Val Thr Val Cys Phe Leu Val Pro Ala Val Ile Phe	
180 185 190	
gcc cac ctc gag gag gcc tgg agc ttc ttg gat gcc ttc tac ttc tgc	624
Ala His Leu Glu Glu Ala Trp Ser Phe Leu Asp Ala Phe Tyr Phe Cys	
195 200 205	
ttt atc tct ctg tcc acc atc ggc ctg ggc gac tac gtg ccc ggg gag	672
Phe Ile Ser Leu Ser Thr Ile Gly Leu Gly Asp Tyr Val Pro Gly Glu	
210 215 220	
gcc cct ggc cag ccc tac cgg gcc ctc tac aag gtg ctg gtc aca gtc	720
Ala Pro Gly Gln Pro Tyr Arg Ala Leu Tyr Lys Val Leu Val Thr Val	
225 230 235 240	
tac ctc ttc ctg ggc ctg gtg gcc atg gtg ctg gtg ctg cag acc ttc	768
Tyr Leu Phe Leu Gly Leu Val Ala Met Val Leu Val Leu Gln Thr Phe	
245 250 255	
cgc cac gtg tcc gac ctc cac ggc ctc acg gag ctc atc ctg ctg ccc	816
Arg His Val Ser Asp Leu His Gly Leu Thr Glu Leu Ile Leu Leu Pro	
260 265 270	

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cct ccg tgc cct gcc agt ttc aat gcg gat gag gac gat cgg gtg gac 864
Pro Pro Cys Pro Ala Ser Phe Asn Ala Asp Glu Asp Asp Arg Val Asp
      275                      280                      285

atc ctg ggc ccc cag ccg gag tcg cac cag caa ctc tct gcc agc tcc 912
Ile Leu Gly Pro Gln Pro Glu Ser His Gln Gln Leu Ser Ala Ser Ser
      290                      295                      300

cac acc gac tac gct tcc atc ccc agg 939
His Thr Asp Tyr Ala Ser Ile Pro Arg
305                      310

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<213> Homo sapiens
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cgggcactcc taccatctct tcttgccggg gcttag atg ctc ctg cct ctt cca 174
                        Met Leu Leu Pro Leu Pro
                        1                      5

cca gct cct ctt gcc ctg cat gct tca ggg acg atg gag gtc tcg ggg 222
Pro Ala Pro Leu Ala Leu His Ala Ser Gly Thr Met Glu Val Ser Gly
      10                      15                      20

cac ccc cag gcc agg aga tgc tgc cca gag gcc ctg gga aag ctc ttc 270
His Pro Gln Ala Arg Arg Cys Cys Pro Glu Ala Leu Gly Lys Leu Phe
      25                      30                      35

cct ggc ctc tgc ttc ctc tgc ttt ctg gtg acc tac gcc ctg gtg ggt 318
Pro Gly Leu Cys Phe Leu Cys Phe Leu Val Thr Tyr Ala Leu Val Gly
      40                      45                      50

gct gtg gtc ttc tct gcc att gag gac ggc cag gtc ctg gtg gca gca 366
Ala Val Val Phe Ser Ala Ile Glu Asp Gly Gln Val Leu Val Ala Ala
      55                      60                      65                      70

gat gat gga gag ttt gag aag ttc ttg gag gag ctc tgc aga atc ttg 414
Asp Asp Gly Glu Phe Glu Lys Phe Leu Glu Glu Leu Cys Arg Ile Leu
      75                      80                      85

aac tgc agt gaa aca gtg gtg gaa gac aga aaa cag gat ctc cag ggg 462
Asn Cys Ser Glu Thr Val Val Glu Asp Arg Lys Gln Asp Leu Gln Gly
      90                      95                      100

cat ctg cag aag gtg aag cct cag tgg ttt aac agg acc aca cac tgg 510
His Leu Gln Lys Val Lys Pro Gln Trp Phe Asn Arg Thr Thr His Trp
      105                      110                      115

tcc ttc ctg agc tcg ctc ttt ttc tgc tgc acg gtg ttc agc acc gtg 558
Ser Phe Leu Ser Ser Leu Phe Phe Cys Cys Thr Val Phe Ser Thr Val
      120                      125                      130

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ggc tat ggc tac atc tac ccc gtc acc agg ctt ggc aag tac ttg tgc	606
Gly Tyr Gly Tyr Ile Tyr Pro Val Thr Arg Leu Gly Lys Tyr Leu Cys	
135 140 145 150	
atg ctc tat gct ctc ttt ggt atc ccc ctg atg ttc ctc gtt ctc acg	654
Met Leu Tyr Ala Leu Phe Gly Ile Pro Leu Met Phe Leu Val Leu Thr	
155 160 165	
gac aca ggc gac atc ctg gca acc atc tta tct aca tct tat aat cgg	702
Asp Thr Gly Asp Ile Leu Ala Thr Ile Leu Ser Thr Ser Tyr Asn Arg	
170 175 180	
ttc cga aaa ttc cct ttc ttt acc cgc ccc ctc ctc tcc aag tgg tgc	750
Phe Arg Lys Phe Pro Phe Phe Thr Arg Pro Leu Leu Ser Lys Trp Cys	
185 190 195	
ccc aaa tct ctc ttc aag aaa aaa ccg gac ccc aag ccc gca gat gaa	798
Pro Lys Ser Leu Phe Lys Lys Lys Pro Asp Pro Lys Pro Ala Asp Glu	
200 205 210	
gct gtc cct cag atc atc atc agt gct gaa gag ctt cca ggc ccc aaa	846
Ala Val Pro Gln Ile Ile Ile Ser Ala Glu Glu Leu Pro Gly Pro Lys	
215 220 225 230	
ctt ggc aca tgt cct tca cgc cca agc tgc agc atg gag ctg ttt gag	894
Leu Gly Thr Cys Pro Ser Arg Pro Ser Cys Ser Met Glu Leu Phe Glu	
235 240 245	
aga tct cat gcg cta gag aaa cag aac aca ctg caa ctg ccc cca caa	942
Arg Ser His Ala Leu Glu Lys Gln Asn Thr Leu Gln Leu Pro Pro Gln	
250 255 260	
gcc atg gag agg agt aac tcg tgt ccc gaa ctg gtg ttg gga aga ctc	990
Ala Met Glu Arg Ser Asn Ser Cys Pro Glu Leu Val Leu Gly Arg Leu	
265 270 275	
tca tac tcc atc atc agc aac ctg gat gaa gtt gga cag cag gtg gag	1038
Ser Tyr Ser Ile Ile Ser Asn Leu Asp Glu Val Gly Gln Gln Val Glu	
280 285 290	
agg ttg gac atc ccc ctc ccc atc att gcc ctt att gtt ttt gcc tac	1086
Arg Leu Asp Ile Pro Leu Pro Ile Ile Ala Leu Ile Val Phe Ala Tyr	
295 300 305 310	
att tcc tgt gca gct gcc atc ctc ccc ttc tgg gag aca cag ttg gat	1134
Ile Ser Cys Ala Ala Ala Ile Leu Pro Phe Trp Glu Thr Gln Leu Asp	
315 320 325	
ttc gag aat gcc ttc tat ttc tgc ttt gtc aca ctc acc acc att ggg	1182
Phe Glu Asn Ala Phe Tyr Phe Cys Phe Val Thr Leu Thr Thr Ile Gly	
330 335 340	
ttt ggg gat act gtt tta gaa cac cct aac ttc ttc ctg ttc ttc tcc	1230
Phe Gly Asp Thr Val Leu Glu His Pro Asn Phe Phe Leu Phe Phe Ser	
345 350 355	
att tat atc atc gtt gga atg gag att gtg ttc att gct ttc aag ttg	1278
Ile Tyr Ile Ile Val Gly Met Glu Ile Val Phe Ile Ala Phe Lys Leu	
360 365 370	

gtg caa aac agg ctg att gac ata tac aaa aat gtt atg cta ttc ttt 1326
 Val Gln Asn Arg Leu Ile Asp Ile Tyr Lys Asn Val Met Leu Phe Phe
 375 380 385 390

gca aaa ggg aag ttt tac cac ctt gtt aaa aag tgaaggtttc attatctctc 1379
 Ala Lys Gly Lys Phe Tyr His Leu Val Lys Lys
 395 400

aggtgacaga cactggctga gctgggttttc ttgtgttgtc tttcaggggc atgcagcctg 1439

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gccctgc 1506

<210> 11

<211> 401

<212> PRT

<213> Homo sapiens

<400> 11

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Ala Leu Gly Lys Leu Phe Pro Gly Leu Cys Phe Leu Cys Phe Leu Val
 35 40 45

Thr Tyr Ala Leu Val Gly Ala Val Val Phe Ser Ala Ile Glu Asp Gly
 50 55 60

Gln Val Leu Val Ala Ala Asp Asp Gly Glu Phe Glu Lys Phe Leu Glu
 65 70 75 80

Glu Leu Cys Arg Ile Leu Asn Cys Ser Glu Thr Val Val Glu Asp Arg
 85 90 95

Lys Gln Asp Leu Gln Gly His Leu Gln Lys Val Lys Pro Gln Trp Phe
 100 105 110

Asn Arg Thr Thr His Trp Ser Phe Leu Ser Ser Leu Phe Phe Cys Cys
 115 120 125

Thr Val Phe Ser Thr Val Gly Tyr Gly Tyr Ile Tyr Pro Val Thr Arg
 130 135 140

Leu Gly Lys Tyr Leu Cys Met Leu Tyr Ala Leu Phe Gly Ile Pro Leu
 145 150 155 160

Met Phe Leu Val Leu Thr Asp Thr Gly Asp Ile Leu Ala Thr Ile Leu
 165 170 175

Ser Thr Ser Tyr Asn Arg Phe Arg Lys Phe Pro Phe Phe Thr Arg Pro
 180 185 190

Leu Leu Ser Lys Trp Cys Pro Lys Ser Leu Phe Lys Lys Lys Pro Asp
 195 200 205

Pro Lys Pro Ala Asp Glu Ala Val Pro Gln Ile Ile Ile Ser Ala Glu
 210 215 220

Glu	Leu	Pro	Gly	Pro	Lys	Leu	Gly	Thr	Cys	Pro	Ser	Arg	Pro	Ser	Cys
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Ser	Met	Glu	Leu	Phe	Glu	Arg	Ser	His	Ala	Leu	Glu	Lys	Gln	Asn	Thr
				245					250					255	
Leu	Gln	Leu	Pro	Pro	Gln	Ala	Met	Glu	Arg	Ser	Asn	Ser	Cys	Pro	Glu
			260					265					270		
Leu	Val	Leu	Gly	Arg	Leu	Ser	Tyr	Ser	Ile	Ile	Ser	Asn	Leu	Asp	Glu
		275					280					285			
Val	Gly	Gln	Gln	Val	Glu	Arg	Leu	Asp	Ile	Pro	Leu	Pro	Ile	Ile	Ala
	290					295				300					
Leu	Ile	Val	Phe	Ala	Tyr	Ile	Ser	Cys	Ala	Ala	Ala	Ile	Leu	Pro	Phe
305					310					315					320
Trp	Glu	Thr	Gln	Leu	Asp	Phe	Glu	Asn	Ala	Phe	Tyr	Phe	Cys	Phe	Val
				325					330					335	
Thr	Leu	Thr	Thr	Ile	Gly	Phe	Gly	Asp	Thr	Val	Leu	Glu	His	Pro	Asn
			340					345					350		
Phe	Phe	Leu	Phe	Phe	Ser	Ile	Tyr	Ile	Ile	Val	Gly	Met	Glu	Ile	Val
		355					360					365			
Phe	Ile	Ala	Phe	Lys	Leu	Val	Gln	Asn	Arg	Leu	Ile	Asp	Ile	Tyr	Lys
	370					375					380				
Asn	Val	Met	Leu	Phe	Phe	Ala	Lys	Gly	Lys	Phe	Tyr	His	Leu	Val	Lys
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Lys

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Met	Leu	Leu	Pro	Leu	Pro	Pro	Ala	Pro	Leu	Ala	Leu	His	Ala	Ser	Gly	
1				5					10				15			
acg	atg	gag	gtc	tcg	ggg	cac	ccc	cag	gcc	agg	aga	tgc	tgc	cca	gag	96
Thr	Met	Glu	Val	Ser	Gly	His	Pro	Gln	Ala	Arg	Arg	Cys	Cys	Pro	Glu	
			20					25					30			
gcc	ctg	gga	aag	ctc	ttc	cct	ggc	ctc	tgc	ttc	ctc	tgc	ttt	ctg	gtg	144
Ala	Leu	Gly	Lys	Leu	Phe	Pro	Gly	Leu	Cys	Phe	Leu	Cys	Phe	Leu	Val	
		35					40					45				
acc	tac	gcc	ctg	gtg	ggt	gct	gtg	gtc	ttc	tct	gcc	att	gag	gac	ggc	192
Thr	Tyr	Ala	Leu	Val	Gly	Ala	Val	Val	Phe	Ser	Ala	Ile	Glu	Asp	Gly	
	50					55					60					

cag gtc ctg gtg gca gca gat gat gga gag ttt gag aag ttc ttg gag	240
Gln Val Leu Val Ala Ala Asp Asp Gly Glu Phe Glu Lys Phe Leu Glu	
65 70 75 80	
gag ctc tgc aga atc ttg aac tgc agt gaa aca gtg gtg gaa gac aga	288
Glu Leu Cys Arg Ile Leu Asn Cys Ser Glu Thr Val Val Glu Asp Arg	
85 90 95	
aaa cag gat ctc cag ggg cat ctg cag aag gtg aag cct cag tgg ttt	336
Lys Gln Asp Leu Gln Gly His Leu Gln Lys Val Lys Pro Gln Trp Phe	
100 105 110	
aac agg acc aca cac tgg tcc ttc ctg agc tcg ctc ttt ttc tgc tgc	384
Asn Arg Thr Thr His Trp Ser Phe Leu Ser Ser Leu Phe Phe Cys Cys	
115 120 125	
acg gtg ttc agc acc gtg ggc tat ggc tac atc tac ccc gtc acc agg	432
Thr Val Phe Ser Thr Val Gly Tyr Gly Tyr Ile Tyr Pro Val Thr Arg	
130 135 140	
ctt ggc aag tac ttg tgc atg ctc tat gct ctc ttt ggt atc ccc ctg	480
Leu Gly Lys Tyr Leu Cys Met Leu Tyr Ala Leu Phe Gly Ile Pro Leu	
145 150 155 160	
atg ttc ctc gtt ctc acg gac aca ggc gac atc ctg gca acc atc tta	528
Met Phe Leu Val Leu Thr Asp Thr Gly Asp Ile Leu Ala Thr Ile Leu	
165 170 175	
tct aca tct tat aat cgg ttc cga aaa ttc cct ttc ttt acc cgc ccc	576
Ser Thr Ser Tyr Asn Arg Phe Arg Lys Phe Pro Phe Phe Thr Arg Pro	
180 185 190	
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Leu Leu Ser Lys Trp Cys Pro Lys Ser Leu Phe Lys Lys Lys Pro Asp	
195 200 205	
ccc aag ccc gca gat gaa gct gtc cct cag atc atc atc agt gct gaa	672
Pro Lys Pro Ala Asp Glu Ala Val Pro Gln Ile Ile Ile Ser Ala Glu	
210 215 220	
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Glu Leu Pro Gly Pro Lys Leu Gly Thr Cys Pro Ser Arg Pro Ser Cys	
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Ser Met Glu Leu Phe Glu Arg Ser His Ala Leu Glu Lys Gln Asn Thr	
245 250 255	
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Leu Gln Leu Pro Pro Gln Ala Met Glu Arg Ser Asn Ser Cys Pro Glu	
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ctg gtg ttg gga aga ctc tca tac tcc atc atc agc aac ctg gat gaa	864
Leu Val Leu Gly Arg Leu Ser Tyr Ser Ile Ile Ser Asn Leu Asp Glu	
275 280 285	
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Val Gly Gln Gln Val Glu Arg Leu Asp Ile Pro Leu Pro Ile Ile Ala	
290 295 300	

ctt att gtt ttt gcc tac att tcc tgt gca gct gcc atc ctc ccc ttc	960
Leu Ile Val Phe Ala Tyr Ile Ser Cys Ala Ala Ala Ile Leu Pro Phe	
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Trp Glu Thr Gln Leu Asp Phe Glu Asn Ala Phe Tyr Phe Cys Phe Val	
325 330 335	
aca ctc acc acc att ggg ttt ggg gat act gtt tta gaa cac cct aac	1056
Thr Leu Thr Thr Ile Gly Phe Gly Asp Thr Val Leu Glu His Pro Asn	
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Phe Phe Leu Phe Phe Ser Ile Tyr Ile Ile Val Gly Met Glu Ile Val	
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Phe Ile Ala Phe Lys Leu Val Gln Asn Arg Leu Ile Asp Ile Tyr Lys	
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Asn Val Met Leu Phe Phe Ala Lys Gly Lys Phe Tyr His Leu Val Lys	
385 390 395 400	
aag	1203
Lys	